

**REMARKS**

Claim 16 is currently being amended to traverse the Examiner's rejection based on 35 U.S.C. 112, 2<sup>nd</sup> paragraph. Accordingly, Applicant asserts no subject matter has been relinquished by this amendment.

These amendments do not introduce new matter within the meaning of 35 U.S.C. §132. As such, the Examiner is respectfully requested to enter the amendment.

**1. Rejection of Claims 16-24 Under 35 U.S.C. §112, 2<sup>nd</sup> Paragraph**

The Office Action states,

Claims 16-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16 does not share the same scope as the original claim 1 filed previously. The original claim 1 is claiming a process of making a catalyst comprising a) combining a support such as silica with aluminoxane to form a treated support and subsequently (b) contacting the treated support with the reaction product of a metallocene compound and alkylaluminum of formula (VIII). However, the current claim 16 is claiming a process of making said catalyst comprising a) combining a support such as silica with aluminoxane to form a treated support and subsequently (b) reacting a metallocene compound and alkylaluminum of formula (VIII). The description on page 5, lines 6-7 is ungrammatical, the examiner suggest changing the current claim language back to the original language as filed in original claim 1. The limitation, "the suspension medium is removed by evaporation after the metallocene compound of formula (I) is reacted with the at least one organometallic compound of formula (VIII)", is not in the claims previously filed.

**RESPONSE**

Applicant respectfully traverses the rejection of claims 16-24.

In particular, the Examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. 112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. Additionally, when the Examiner is satisfied that patentable subject matter is disclosed, and it is apparent to the examiner that the claims are directed to such patentable subject matter, he or she should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. See MPEP §2173.02.

Additionally, Applicant respectfully traverses the Examiner's basis for the current rejection, insomuch that definiteness under 35 U.S.C. 112, 2<sup>nd</sup> paragraph is not based on whether newly added claims do, or do not have the same scope as previously pending, and subsequently cancelled claims. For this reason alone the rejection should be withdrawn.

Notwithstanding, Applicant has amended claim 16 as shown in ATTACHMENT A. Accordingly, Applicant respectfully believes claims 16-24 fully comply with 35 U.S.C. 112, second paragraph, and that one having ordinary skill in the art would appreciate the metes and bounds thereof. Basis for the amendments can be found on page 8,

lines 25-36, and page 13, lines 36-39, of Applicant's specification. As such, Applicant respectfully requests the Examiner to withdraw this rejection.

**2. Rejection of Claims 16-24 Under 35 U.S.C. §102(b)**

The Office Action states that claims 16-24 are rejected under 35 U.S.C. §102(b) as being anticipated by WO 01/46274, equivalent to U.S. 2003/0130443 (herein referred to as "Suhm, et al."). In particular, the Office Action states,

Suhm's paragraphs [0311] to [0313] on page 14 as cited in the previous Office action teaches a process for making a supported catalyst comprising (i) reacting silica and methylaluminoxane (MAO) in a solution to provide a treated silica; subsequently (ii) contacting the solution of dimethylsilanediylbis(2-methyl-4,5-benzindenyl)zirconium dichloride and MAO with the treated silica to provide a slurry, and (iii) distilling off the solvent in vacuo to provide free-flowing catalyst particulate. It is understood that MAO used in the lab is actually a mixture of methylaluminoxane and trimethyl aluminum, thus, the solution of dimethylsilanediylbis(2-methyl-4,5-benzindenyl)zirconium dichloride and MAO comprising the product of dimethylsilanediylbis(2-methyl-4,5-benzindenyl)zirconium dichloride and trimethyl aluminum. Thus, Suhm's solution of dimethylsilanediylbis(2-methyl-4,5-benzindenyl)zirconium dichloride and MAO comprises the reaction product of dimethylsilanediylbis(2-methyl-4,5-benzindenyl) zirconium dichloride and trimethyl aluminum. Therefore, Suhm's teaching anticipates the instant claims.

**RESPONSE**

Applicant respectfully traverses the rejection of claims 16-24.

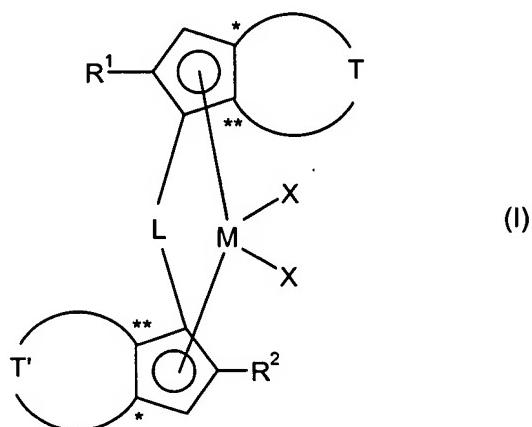
For a reference to anticipate an invention, all of the elements of that invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as

set forth in the claims is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must also be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicant respectfully believes Suhm, et al., fails to disclose, teach, or suggest, "A process for preparing a catalyst solid for olefin polymerization comprising a finely divided support, an aluminoxane, a metallocene compound product, and an organometallic compound, wherein the process comprises

-combining the finely divided support with the aluminoxane to form a modified support, and subsequently

-reacting a metallocene compound of formula (I),



where

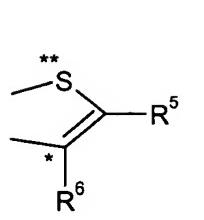
M is zirconium, hafnium or titanium;

X are identical or different and are each, independently of one another, hydrogen or halogen or a group -R, -OR, -OSO<sub>2</sub>CF<sub>3</sub>, -OCOR, -SR, -NR<sub>2</sub> or -PR<sub>2</sub>, where R is linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl, C<sub>3</sub>-C<sub>20</sub>-cycloalkyl which may bear one or more C<sub>1</sub>-C<sub>10</sub>-alkyl radicals as substituents, C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl and may contain one or more heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or one or more unsaturated bonds, with the two radicals X also being able to be joined to one another;

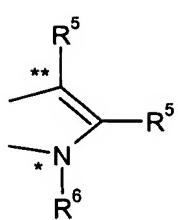
L is a divalent bridging group selected from the group consisting of C<sub>1</sub>-C<sub>20</sub>-alkylidene, C<sub>3</sub>-C<sub>20</sub>-cycloalkylidene, C<sub>6</sub>-C<sub>20</sub>-arylidene, C<sub>7</sub>-C<sub>20</sub>-alkylarylidene and C<sub>7</sub>-C<sub>20</sub>-arylalkylidene radicals which may contain heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or is a silylidene group having up to 5 silicon atoms;

R<sup>1</sup> and R<sup>2</sup> are identical or different and are each, independently of one another, hydrogen or linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl which may bear one or more C<sub>1</sub>-C<sub>10</sub>-alkyl radicals as substituents, C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>40</sub>-alkylaryl or C<sub>7</sub>-C<sub>40</sub>-arylalkyl and may contain one or more heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or one or more unsaturated bonds;

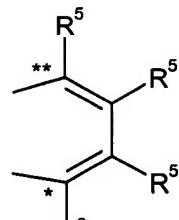
T and T' are divalent groups of the formulae (II), (III), (IV), (V), (VI) or (VII),



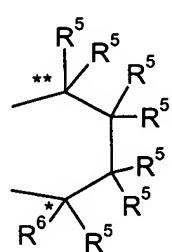
(II)



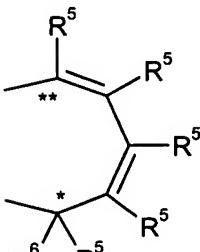
(III)



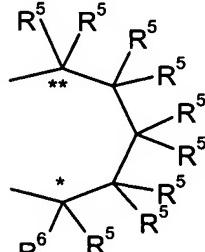
(IV)



(V)



(VI)



(VII)

where

the atoms denoted by the symbols \* and \*\* are in each case joined to the atoms of the compound of the formula (I) which are denoted by the same symbol; and

$R^5$  and  $R^6$  are identical or different and are each, independently of one another, hydrogen or halogen or linear or branched  $C_1-C_{20}$ -alkyl or  $C_3-C_{20}$ -cycloalkyl which may bear one or more  $C_1-C_{10}$ -alkyl radicals as substituents,  $C_6-C_{40}$ -aryl,  $C_7-C_{40}$ -alkylaryl or  $C_7-C_{40}$ -arylalkyl and may contain one or more heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or one or more unsaturated bonds or two radicals  $R^5$  or  $R^6$  are joined to one another to form a saturated or unsaturated  $C_3-C_{20}$  ring;

with at least one organometallic compound of formula (VIII)



where

$M^1$  is an alkali metal, an alkaline earth metal or a metal of group 13 of the Periodic Table;

$R^7$  is hydrogen,  $C_1-C_{10}$ -alkyl,  $C_3-C_{10}$ -cycloalkyl,  $C_6-C_{15}$ -aryl, alkylaryl or arylalkyl each having from 1 to 10 carbon atoms in the alkyl part and from 6 to 20 carbon atoms in the aryl part;

$R^8$  and  $R^9$  are each hydrogen, halogen,  $C_1-C_{10}$ -alkyl,  $C_3-C_{10}$ -cycloalkyl,  $C_6-C_{15}$ -aryl, alkylaryl, arylalkyl or alkoxy each having from 1 to 10 carbon atoms in the alkyl part and from 6 to 20 carbon atoms in the aryl part;

$r$  is an integer from 1 to 3;

and

$s$  and  $t$  are integers from 0 to 2, where the sum  $r+s+t$  corresponds to the valence of  $M^3$ ; wherein the organometallic compounds of formula (VIII) comprise at least one branched alkyl radical comprising up to 10 carbon atoms, or a cycloalkyl radical comprising from 3 to 10 carbon atoms;

to form a reaction product which is added to the modified support, wherein the finely divided support and aluminoxane are combined in suspension, and the reaction product and the modified support are contacted in suspension with the suspension medium

being removed by evaporation after the reaction product is contacted with the modified support."

In particular, Applicant believes Suhm, et al., fails to disclose, teach, or suggest a process for preparing a catalyst solid comprising reacting a metallocene compound of formula (I) with at least one organometallic compound of formula (VIII), wherein the organometallic compounds of formula (VIII) comprise at least one branched alkyl radical comprising up to 10 carbon atoms, or a cycloalkyl radical comprising from 3 to 10 carbon atoms.

In light of the above, claims 16-24 are therefore believed to be patentable over Suhm, et al. Accordingly, reconsideration and withdrawal of the rejection is requested.

**4. Rejection of Claims 16-24 Under 35 U.S.C. §103(a)**

The Office Action states that claims 16-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,339,128 (herein referred to as "Nakayama, et al.") and WO 01/46274 (herein referred to as "Suhm, et al."). In particular, the Office Action states,

Suhm's teaching is relied upon as shown above. It is noted the cited prior art does not expressly teach contacting the metallocene and the trialkyl aluminum alone prior to contacting the alumoxane treated support. It is noted that the metallocene complex of the cited prior art are chlorinated metallocene which often has poor solubilities in hydrocarbons, the chlorinated metallocenes are routinely treated with alkyl aluminum before use to provide the alkylated metallocene with improved solubilities in the reaction media.

Thus, it would have been obvious to a skilled artisan at the time the invention was made to employ treat the chlorinated metallocene complex with alkyl aluminum to provide an alkylated metallocene with improved solubility in the reaction media to provide a supported catalyst with minimized unsupported metallocene and thus reduce fouling during the polymerization process and in the absence of any showing criticality and unexpected results. When the alkylated metallocene prepared by treating the chlorinated metallocenes with alkyl aluminum is used to prepare the catalyst composition, the teaching of the cited prior art meets the limitation of the instant claims.

**RESPONSE**

Applicant respectfully traverses the rejection of claims 16-24.

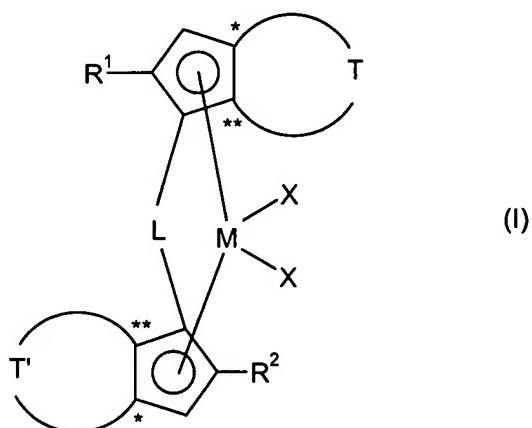
The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

Arguments regarding Suhm, et al. discussed *supra* are incorporated herein by reference in their entirety. Accordingly, Applicant respectfully believes Nakayama, et al. does not remedy the deficiencies of Suhm, et al.

In particular, Applicant believes Nakayama, et al., does not disclose, teach, or suggest, "A process for preparing a catalyst solid for olefin polymerization comprising a finely divided support, an aluminoxane, a metallocene compound product, and an organometallic compound, wherein the process comprises

- combining the finely divided support with the aluminoxane to form a modified support, and subsequently
- reacting a metallocene compound of formula (I),



where

M is zirconium, hafnium or titanium;

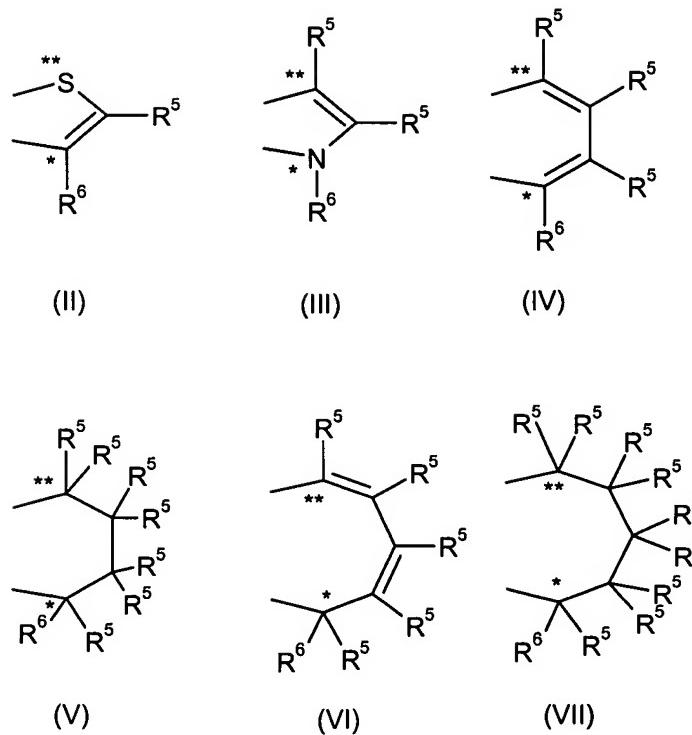
X are identical or different and are each, independently of one another, hydrogen or halogen or a group -R, -OR, -OSO<sub>2</sub>CF<sub>3</sub>, -OCOR, -SR, -NR<sub>2</sub> or -PR<sub>2</sub>, where R is linear or branched C<sub>1</sub>-C<sub>20</sub>-

alkyl, C<sub>3</sub>-C<sub>20</sub>-cycloalkyl which may bear one or more C<sub>1</sub>-C<sub>10</sub>-alkyl radicals as substituents, C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl and may contain one or more heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or one or more unsaturated bonds, with the two radicals X also being able to be joined to one another;

L is a divalent bridging group selected from the group consisting of C<sub>1</sub>-C<sub>20</sub>-alkylidene, C<sub>3</sub>-C<sub>20</sub>-cycloalkylidene, C<sub>6</sub>-C<sub>20</sub>-arylidene, C<sub>7</sub>-C<sub>20</sub>-alkylarylidene and C<sub>7</sub>-C<sub>20</sub>-arylalkylidene radicals which may contain heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or is a silylidene group having up to 5 silicon atoms;

R<sup>1</sup> and R<sup>2</sup> are identical or different and are each, independently of one another, hydrogen or linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl which may bear one or more C<sub>1</sub>-C<sub>10</sub>-alkyl radicals as substituents, C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>40</sub>-alkylaryl or C<sub>7</sub>-C<sub>40</sub>-arylalkyl and may contain one or more heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or one or more unsaturated bonds;

T and T' are divalent groups of the formulae (II), (III), (IV), (V), (VI) or (VII),



where

the atoms denoted by the symbols \* and \*\* are in each case joined to the atoms of the compound of the formula (I) which are denoted by the same symbol; and

R<sup>5</sup> and R<sup>6</sup> are identical or different and are each, independently of one another, hydrogen or halogen or linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl which may bear one or more C<sub>1</sub>-C<sub>10</sub>-alkyl radicals as substituents, C<sub>6</sub>-C<sub>40</sub>-aryl, C<sub>7</sub>-C<sub>40</sub>-alkylaryl or C<sub>7</sub>-C<sub>40</sub>-arylalkyl and may contain one or more heteroatoms from groups 13 - 17 of the Periodic Table of the Elements or one or more unsaturated bonds or two radicals R<sup>5</sup> or R<sup>6</sup> and R<sup>6</sup> are joined to one another to form a saturated or unsaturated C<sub>3</sub>-C<sub>20</sub> ring;

with at least one organometallic compound of formula (VIII)



where

$M^1$  is an alkali metal, an alkaline earth metal or a metal of group 13 of the Periodic Table;

$R^7$  is hydrogen,  $C_1-C_{10}$ -alkyl,  $C_3-C_{10}$ -cycloalkyl,  $C_6-C_{15}$ -aryl, alkylaryl or arylalkyl each having from 1 to 10 carbon atoms in the alkyl part and from 6 to 20 carbon atoms in the aryl part;

$R^8$  and  $R^9$  are each hydrogen, halogen,  $C_1-C_{10}$ -alkyl,  $C_3-C_{10}$ -cycloalkyl,  $C_6-C_{15}$ -aryl, alkylaryl, arylalkyl or alkoxy each having from 1 to 10 carbon atoms in the alkyl part and from 6 to 20 carbon atoms in the aryl part;

$r$  is an integer from 1 to 3;

and

$s$  and  $t$  are integers from 0 to 2, where the sum  $r+s+t$  corresponds to the valence of  $M^3$ ; wherein the organometallic compounds of formula (VIII) comprise at least one branched alkyl radical comprising up to 10 carbon atoms, or a cycloalkyl radical comprising from 3 to 10 carbon atoms;

to form a reaction product which is added to the modified support, wherein the finely divided support and aluminoxane are combined in

suspension, and the reaction product and the modified support are contacted in suspension with the suspension medium being removed by evaporation after the reaction product is contacted with the modified support."

In particular, Applicant believes Nakayama, et al. fails to disclose, teach, or suggest (i) combining a finely divided support with an aluminoxane to form a modified support, and (ii) reacting a metallocene compound of formula (I) with at least one organometallic compound of formula (VIII), wherein the organometallic compounds of formula (VIII) comprise at least one branched alkyl radical comprising up to 10 carbon atoms, or a cycloalkyl radical comprising from 3 to 10 carbon atoms.

In light of the above, claims 16-24 are therefore believed to be patentable over Nakayama, et al. in view of Suhm, et al. Accordingly, reconsideration and withdrawal of the rejection is requested.

#### CONCLUSION

Based upon the above remarks, the presently claimed subject matter is believed to be novel and patentably distinguishable over the references of record. The Examiner is therefore respectfully requested to reconsider and withdraw all rejections and allow all pending claims 16-24. Favorable action with an early allowance of the claims pending in this application is earnestly solicited.

The Examiner is welcomed to telephone the undersigned practitioner if she has any questions or comments.

Respectfully submitted,

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Jarrod N. Raphael  
Signature

June 12 2007  
Date